## Claims

[c1] A flow control system, comprising:

a substantially rigid vessel having first and second ends;

the first end of the rigid vessel having an inlet and an outlet;

a process fluid reservoir situated in the rigid vessel in fluid communication with the inlet and the outlet; and

a movable member positioned in the rigid vessel, such that movement of the movable member in a first direction causes process fluid to be drawn into the inlet and movement of the movable member in a second direction causes process fluid to be expelled from the outlet.

[c2] The flow control system of claim 1, wherein the rigid vessel comprises a cylinder.

[c3] The flow control system of claim 1, wherein the process fluid reservoir includes a bladder situated in the rigid vessel in fluid communication with the inlet and the outlet.

[c4] The flow control system of claim 2, wherein the movable member comprises a plunger slidably positioned in the cylinder.

[c5] 5. The flow control system of claim 4, further comprising a piston connected to the plunger for activating the plunger.

[c6] The flow control system of claim 5, further comprising a stepper motor operatively connected to the piston for actuating the plunger.

[c7] The flow control system of claim 1, wherein the inlet and the outlet include inlet and outlet check valves, respectively.

[c8] The flow control system of claim 4, wherein the plunger is fabricated from PFA.

[c9] The flow control system of claim 3, wherein the bladder is fabricated from PFA.

[c10] The flow control system of claim 1, further comprising a drive fluid reservoir situated in the rigid vessel.

[c11] The flow control system of claim 10, wherein the movable member comprises a diaphragm that separates the drive fluid reservoir from the process fluid reservoir.

[c12] The flow control system of claim 11, wherein the diaphragm is fabricated from PFA.

[c13] The flow control system of claim 11, further comprising a pump in fluid communication with the working fluid reservoir to selectively meter working fluid into and out of the working fluid reservoir, such that metering working fluid out of the working fluid reservoir displaces the diaphragm in the first direction to draw process fluid into the inlet and metering working fluid into the working fluid reservoir displaces the diaphragm in the second direction to expel process fluid from the outlet.

[c14] A flow control system, comprising:

a substantially rigid vessel;

a process fluid outlet defined by the rigid vessel;

a flexible process fluid reservoir situated in the rigid vessel in fluid communication with the process fluid outlet; and

a working fluid reservoir situated in the rigid vessel substantially surrounding the process fluid reservoir, the rigid vessel defining a working fluid inlet, such that working fluid received into the working fluid reservoir compresses the process fluid reservoir to expel process fluid therefrom through the process fluid outlet.

[c15] The flow control system of claim 14, further comprising a pump connected to the working fluid inlet for metering working fluid into the working fluid reservoir.

[c16] The flow control system of claim 14, further comprising a filter connected to the process fluid outlet.

[c17] The flow control system of claim 14, further comprising mixer for mixing process fluid contained within the process fluid reservoir.

[c18] The flow control system of claim 17, wherein the mixer comprises an ultrasonic mixer.

[c19] The flow control system of claim 14, wherein the working fluid reservoir comprises a disposable bag.

[c20] A flow control system, comprising:

a substantially rigid vessel;

a process fluid outlet defined by the rigid vessel;

means for containing a process fluid situated inside the rigid vessel;

means for metering the process fluid from the rigid vessel through the process fluid outlet.

[c21] A method of controlling the flow of slurry to a CMP tool, comprising:

providing a slurry reservoir containing slurry;

connecting the CMP tool to a slurry outlet in fluid communication with the slurry reservoir; and

collapsing the slurry reservoir to expel slurry from the slurry reservoir to the CMP tool at a desired flow rate.

[c22] The method of claim 21, wherein providing a slurry reservoir containing slurry comprises:

connecting a supply of slurry to a slurry inlet in fluid communication with the slurry reservoir;

opening an inlet valve connected to the slurry inlet;

closing an outlet valve connected to the slurry outlet; and

drawing a predetermined volume of the slurry from the slurry supply into the slurry reservoir.

[c23] The method of claim 22, wherein collapsing the slurry reservoir comprises:

closing the inlet valve; and

opening the outlet valve.

[c24] The method of claim 21, wherein the slurry reservoir and a movable member are situated in a rigid vessel, and wherein collapsing the slurry reservoir comprises moving the movable member in a first direction.

[c25] The method of claim 21, wherein the slurry reservoir is situated in a rigid vessel, and wherein collapsing the slurry reservoir comprises pumping a working fluid into the rigid vessel.

[c26] The method of claim 22, wherein:

the slurry reservoir and a movable member are situated in a rigid vessel;

collapsing the slurry reservoir includes moving the movable member in a first direction;

moving the movable member in a second direction to expel slurry from the slurry reservoir to the CMP tool and

drawing a predetermined volume of the slurry from the slurry supply into the slurry reservoir includes moving the movable member in a second direction.

[c27] The method of claim 21, wherein providing a slurry reservoir containing slurry includes providing a disposable bag containing slurry.